

RADICAL PERINEAL PROSTATECTOMY FOR EARLY CANCER *

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DURING the last decade a large segment of the medical profession has shown a rapidly growing interest in the feasibility of eradication of prostatic cancer by radical surgery. There are probably numerous reasons for the development of this interest, but five in particular come to mind. These are: an increased prevalence of the disease; a rising death rate; the failure of long-term control by endocrine therapy; the availability of the retropubic procedure; and the favorable results of radical perineal prostatectomy in selected cases.

Statistics obtained from postmortem examinations indicate that prostatic cancer is present in at least 14 per cent of men over 50 years of age.¹ In addition to this previously established fact, the Public Health Service reported in 1952 that it had become the second most prevalent malignancy in the male, exceeding in prevalence that of all organs except that of the skin. Moreover, its incidence was found to have increased 38 per cent between 1938 and 1948.²

The Public Health Service also reported in 1952 that of all men who died of malignant disease in the geographical area surveyed, 15.9 per cent died of prostatic cancer. This figure was exceeded only by the percentage of patients dying with cancer of the stomach and lung.²

Endocrine control of prostatic cancer has been only temporary in the overwhelming majority of histologically proved cases. Nesbit and Baum³ (1950) reported the results of castration-estrogen therapy based on figures furnished them by 15 urological clinics in this country. Of 263 patients with metastases on admission, 20 per cent lived five years after castration-estrogen therapy, as compared with 6 per cent of 231 untreated patients. Of 324 patients without metastases, 44 per cent lived five years after castration-estrogen treatment, as compared with 10

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per cent of 273 untreated controls. Staubitz, Oberkircher and Lent⁴ (1954) found that 16 per cent of their patients with metastases, and 24 per cent of those without metastases, lived ten years after endocrine treatment.

Since 1951 some 200 or more patients, who relapsed after castration-estrogen therapy, have been subjected to bilateral adrenalectomy. The results in these cases have been reported in the literature. Although some of these patients unquestionably obtained marked subjective relief, often with disappearance of pain, objective improvement has not been striking. Rarely has there been a decrease in the size and consistency of the local mass or in the palpable soft tissue metastases. Bony metastases have remained essentially unchanged in the roentgenograms, and for the most part, length of life has not been prolonged.

The relatively recent development of a surgical avenue to the prostate far removed from the regrettably unfamiliar perineal route has been responsible for stimulating a large number of urologists, here and abroad, to advocate and perform total prostatectomy for cancer.

Finally, the published results of radical perineal prostatectomy leave little doubt concerning its value, even though its applicability is somewhat limited. Approximately 10 per cent of patients with cancer of the prostate examined at the Johns Hopkins Hospital over a period of 50 years have been subjected to this procedure. During the last ten years the figure for operability has increased from 10 per cent to 19 per cent, despite the fact that the criteria governing suitability have recently been more rigidly defined. The malignant process must be grossly confined to the prostate. This means that the fibrous sheath or true capsule is perfectly smooth, and the gland is movable. The seminal vesicles are normal on palpation throughout their entire extent with no induration along their outer sides or between them. The membranous urethra and bladder neck, and roentgenograms of the spine, pelvis and upper femurs are all normal, together with the level of the serum acid phosphatase. Furthermore, the patient otherwise should have a life expectancy of approximately ten years. For this reason few patients over 70 years of age are suitable subjects.

Characteristically, the earliest stage of prostatic cancer that is recognizable by digital rectal palpation is a small nodule usually quite firm and incompressible in the periphery of the gland and close to the examining finger. It has been stated that only about 5 per cent of

patients with prostatic cancer throughout the country are seen in such an early stage of their disease. This is because a rectal examination, unfortunately, is rarely made by the family physician unless the patient is having specific symptoms, at which time he is usually no longer a suitable subject for radical prostatectomy. It seems obvious that this situation can and should be corrected. In the Army where routine annual rectal examinations are mandatory in men over 40, early, operable prostatic cancer has been detected in 54.5 per cent.⁵ A better understanding of the problem by general practitioners should eventually result in a much higher figure for operability than now exists.

The operation devised by the late Dr. Hugh Young⁶ in 1904 consisted of the surgical removal of the entire prostate gland, the bladder neck, and the seminal vesicles with their anterior and posterior fascial coverings in one intact specimen, by way of the perineum. Kahler⁷ has shown that only about 16 per cent of localized tumors arise within areas of nodular hyperplasia. The rest arise in the peripheral portion of the gland, or surgical capsule. Therefore it is rare for an early cancer to be completely removed by enucleation, or by transurethral resection of the hyperplastic mass, for the portion commencing in, or invading, the surgical capsule is left behind after these operations.

Young's original operation, with a few minor modifications, is still used today and 401 have been performed at the Johns Hopkins Hospital. Approximately half of these have been done in the last ten years, since alert practitioners are now making the diagnosis in a much earlier stage.

Up to 1944, 127 patients with histologically identified cancer survived the operation and have been followed.⁸ Of these, 48 had advanced cancer with grossly palpable involvement of the fibrous capsule of the gland or the seminal vesicles. These patients were operated upon before the era of endocrine therapy, which began in 1941, in the hope that some might be salvaged. Surprisingly enough, six of the 48 (12.5 per cent) did live ten years, and only two later on received endocrine assistance. There were 79 cases in which the preoperative rectal examination showed no palpable evidence of extension beyond the prostate. Thirty-seven per cent of these patients lived ten years without evidence of recurrence. However, microscopic examination of all these surgical specimens showed that the seminal vesicles actually were involved in 39 cases, or practically one-half of the group. Of the remaining 40 cases

TABLE I—CANCER MICROSCOPICALLY CONFINED TO PROSTATE,
40 CASES

	<i>Lived 10 Years or Longer Without Cancer and With- out Endocrine Support</i>	<i>Died With Cancer</i>	<i>Died Without Evidence of Cancer</i>
Grade 1	13	2	1 year, 1 2 years, 3
Grade 2	4	2	3 years, 2 5 years, 1
Grade 3	0	1	6 years, 1 7 years, 3
Not graded	4	2	9 years, 1
Total Cases	21	7	12

of proved cancer, there was no microscopic evidence of extension beyond the prostate. Twenty-one (52 per cent) of these patients lived ten years or longer without recurrence or metastasis and without endocrine treatment (Table I). The surgical specimens removed from the 21 patients who lived ten years or longer without cancer and those from the seven who died with cancer have been carefully scrutinized by Dr. Frederick G. Germuth, Jr., of the Department of Pathology. Of the 21 patients who lived, perineural lymphatic involvement was seen in 12 cases. In nine of these the tumor was considered Grade 1, and in three, Grade 2. Of the seven patients who died with cancer, the perineural lymphatics were found involved in four of the five that were graded.

Dr. Germuth prefers the use of three grades of malignancy instead of four. For this reason, tumors of Grade 1 seemed to predominate. He states: "The tumors were divided according to their microscopic appearance into three different grades of malignancy, the least malignant being Grade 1, and the most malignant Grade 3. The factors observed in grading were: the degree of differentiation; the character of the cells and nuclei; and the completeness with which the normal gland structure was reproduced. Grade 1 consisted of tumors showing well developed acini lined by cuboidal cells. In some instances, slight cellular atypicalities were present. (In the Broders classification some of these tumors would have been designated as Grade 2.) Grade 2 consisted of tumors showing foci of incomplete acinar formation, such that solid cores of tumor were frequent. Grade 3 consisted of tumors demonstrating almost complete lack of acinar formation; for the most part, the microscopic

sections showed scattered undifferentiated cells in random arrangement throughout the stroma."

The average age of patients who lived ten years or more without recurrence or metastasis was 62.8 years, and the youngest patient in this group was 54 years old at the time of operation. Of the 13 patients with tumors of Grade 1, the average age was 61, and of those who had tumors of Grade 2, it was 65.7 years.

There were nine patients (23 per cent) who lived 10½ to 17 years after operation whose seminal vesicles, though grossly normal, were found to be involved after careful microscopic study. Five patients with Grade 1 tumors and one with a Grade 3 tumor have had no recurrence or metastasis, the latter patient having lived 14 years. One patient with a Grade 1 tumor was apparently well for 12 years but died with cancer 16 years after operation. Another with a Grade 2 tumor was clinically free of cancer 11 years after operation but died with cancer six years later, or 17 years after operation. Perineural lymphatics were involved in both cases. One additional patient with an ungraded tumor was clinically well for nine years but died with cancer two years later. Therefore nine of 39 patients with microscopic, but not gross, involvement of the seminal vesicles lived ten years or longer, and six of these 39 patients (15 per cent) have remained free of cancer without endocrine assistance.

These figures show that involvement of the seminal vesicles reduces considerably the ten-year survival rate after radical prostatectomy, and that the cancer is histologically confined to the prostate in only about half the cases in which the vesicles seem normal on rectal examination. Although tumors in the lower grades of malignancy are definitely lethal, their somewhat slower growth and spread probably account for the fact that they so often produce lumps or nodules that can be felt. Tumors of high grade malignancy are seldom recognized in early stages, probably because of their much faster rate of infiltration. Turner and Belt⁹ report that more than 78 per cent of their 229 cases treated by radical perineal prostatectomy consisted of tumors of Grades 1 and 2, and only 3.6 per cent of Grade 4. Culp¹⁰ also states that in 67 radical perineal prostatectomies done by him at the Mayo Clinic, 63 tumors were graded 1 or 2, and none was graded 4. Seventy per cent of his patients who could be followed five years were free of tumor. Three recurrences were among tumors graded 1, two recurrences among

those of Grade 2, and one recurrence among his small group of four Grade 3 tumors. Turner and Belt⁹ found that eight of 17 patients with cancer microscopically confined to the prostate lived ten years or longer (47 per cent).

It is difficult to obtain data permitting an accurate comparison of the results of radical perineal prostatectomy with those after palliative treatment of patients with histologically proved cancer in similar stages of development. However, Barnes¹¹ selected 31 patients who he believed were suitable subjects for the radical operation, but instead of operating he gave them endocrine therapy. Twenty-two per cent of these patients were alive at the end of ten years, still with cancer. Therefore, from the rather limited number of available cases permitting a long-term survey it seems that the radical operation in suitable cases provides a survival rate far superior to that afforded by hormones. The questions that remain to be answered concern the risk of operation and the possibility of incontinence and other complications.

Impotence usually follows effective endocrine therapy as well as radical prostatectomy, and therefore may be disregarded. A distressing, and avoidable, situation, however, is that of permanent impotence resulting from the endocrine treatment of a patient whose prostatic nodule was not cancer. Of 211 prostatic nodules clinically compatible with cancer, which were studied microscopically at the Johns Hopkins Hospital, 108 were benign and 103 were malignant.¹² A surgeon who castrates or renders impotent by estrogen a patient who has a benign area of induration in the prostate gland may be subject to a lawsuit.

It is impossible to distinguish a localized benign nodule in the prostate from one that is malignant by palpation alone. If the roentgenogram shows that the nodule is not a calculus the diagnosis will depend on accurate biopsy. This should be practically 100 per cent accurate when properly taken through a perineal approach. If the tissue is benign the patient is out of the hospital in a few days, with peace of mind, without sacrificing his sexual function, and without submitting to endocrine treatment for the rest of his life.

The mortality and morbidity following radical perineal prostatectomy have steadily declined through the years. In the last 200 cases at the Johns Hopkins Hospital there were six deaths, but there has been no postoperative death on the private service in more than 13 years. Of the last 100 cases, 65 patients were discharged from the hospital between

11 and 19 days after operation.

In these last 100 cases there have been no disabling consequences. Temporary stricture of moderate degree developed at the site of vesico-urethral anastomosis in 15 per cent. Thrombophlebitis of the veins of one leg occurred for a time in six cases. The rectum was injured in four cases, but complete healing followed in all. There have been no fistulas. Perfect urinary control was established in a short time in 84 to 95 per cent of the cases, depending on the type of closure used. With the posterior figure-of-eight mattress suture there was no permanent incontinence in 30 cases.

CONCLUSIONS

Cure of prostatic cancer can be accomplished only by early, complete surgical extirpation. This is feasible in men who have a life expectancy of ten years and who show no evidence of metastasis or of gross extension of the cancer beyond the prostate gland itself. In about half of these cases the tumor will be microscopically localized to the prostate. Fifty per cent of these patients will survive ten years free of cancer after radical perineal prostatectomy, as compared with the expected survivorship of 53 per cent for men of the same age group in the general population.

At the present time these criteria for operability are satisfied in only a small percentage of cases. This percentage could be greatly increased if a presumptive diagnosis of the disease were made more often in the nodule stage by an annual one-minute examination by the family physician.

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